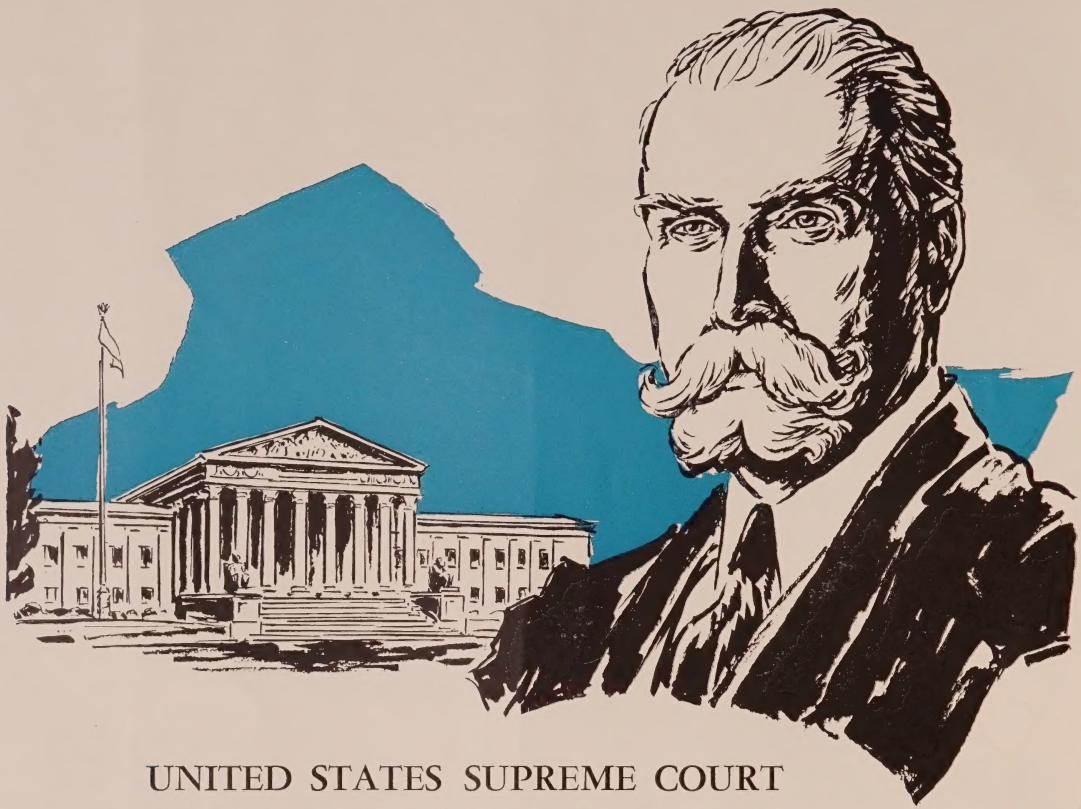
TECHNICIAN ENGINEER

MAY, 1964

Published for the Employees of the Broadcasting, Recording and Related Industries

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS — AFL-CIO



UNITED STATES SUPREME COURT UPHOLDS THE WAGNER ACT

NLRB v. Jones & Laughlin—April 12, 1937

Charles Evans Hughes, Chief Justice of the United States, on April 12, 1937, read a momentous opinion marking the 5-4 decision of the Supreme Court upholding the constitutionality of the National Labor Relations Act — popularly known as the "Wagner Act".

President Franklin D. Roosevelt on July 5, 1935 had signed the bill enacting into law protections for unions, but the Act had met stiff resistance from employers who were reluctant to give up company unions or to make concessions to bona fide labor organizations. The new law, as upheld by the court, declared to be within the province of Congress, under the commerce clause of the Constitution, the power to regulate labor relations in interstate commerce.

In the significant decision Chief Justice Hughes said, "Employes have as clear a right to organize and select their representatives for lawful purposes as the respondent (company) has to organize its business and select its own officers and agents. Discrimination and coercion to prevent the free exercise of the right of the employes to self-organization and representation is a proper subject of condemnation by competent legislative authority."

This decision marked a great turning point in the history of unionism. Coming at a time when labor problems and aspirations were in sharp focus, and workers were seeking recognition and decent gains, the decision as handed down by the nation's highest tribunal, was a great landmark of our times.

Reprinted with permission from THE LABORER, official publication of the International Hod Carriers', Building and Common Laborers' Union of America.

The INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS
GORDON M. FREEMAN — International President
JOSEPH D. KEENAN — International Secretary
JEREMIAH P. SULLIVAN — International Treasurer
ALBERT O. HARDY — Editor, Technician-Engineer

TECHNICIAN ENGINEER

VOL. 13, NO. 5
ALBERT O. HARDY, Editor

in this issue

SECOND I.F.E.W. CONGRESS HELD 4
NEW HIGH-QUALITY TAPE RECORDER AVAILABLE 6
NOW HEAR THIS 8
PRESIDENT DECLARES WAR ON POVERTY 9
NUCLEAR-POWERED, SEABORNE AUTOMATIC WEATHER STATION 10
GAS-POWERED TELEVISION FOR JUNGLES? 12
TECHNICAL NOTES 14
STATION BREAKS 16

the cover

A new portable broadcast television tape recorder, priced well below any other television recorder of broadcast quality, introduced by Ampex Corporation. The VR-660 weighs just under 100 pounds and is designed for mobile and studio use by network, commercial and educational broadcasters throughout the world. It is the only recorder of comparable size which may be used on the air with no additional equipment other than that presently available in most television stations.

index

For the benefit of local unions needing such information in negotiations and planning, here are the latest figures for the cost-of-living index, compared with 1963: March, 1964—107.7; March, 1963—106.3.

commentary

In your efforts to impress childish minds with trade names you can find to a decibel precisely when repetition becomes so annoying as to be intolerable. It's a dubious and dangerous game. In time the victims may not swallow it. They may throw up. Gentlemen, beware! The worm may turn. The victim, if you irritate him enough, has a deadly weapon against you. He can simply tune you out.

—Robert Moses, president, New York World's Fair, commenting on broadcast commercials at a New York luncheon of the International Radio and Television Society.

We cannot today claim ignorance of what is to come. The future is orbiting in the skies above us. On the threshold of the Age of Space, the supreme challenge to the law is to bring new concepts of order in harmony with new concepts of change.

The complex problems involved in this entire subject—technological, political, social and economic—do not lend themselves to simple, easy and quick solutions.

—David Sarnoff, Chairman of the Board, RCA, speaking to a section of the A.B.A., in San Francisco, Calif.

Published monthly by the International Brotherhood of Electrical Workers, AFL-CIO, 1200 Fifteenth St., N.W., Washington, D. C., for the employees of the broadcasting, recording, and related industries. Second class postage paid at Washington, D. C. Subscription, $2 per year.

Sr. Juan Jose Osorio, Gen. Secretary, reports to the Congress. To his left, I.F.E.W. President R. F. Walsh, Vice President Don Conaway, Treasurer Stanley Ballard, and Vice President Hector Mario Spina.

Second IFEW Congress Held

Western Hemisphere Organization Meets in Convention in Venezuela

The Second Congress of the Inter-American Federation of Entertainment Workers convened in Caracas, Venezuela on May 11, 12 and 13, with representatives of eight unions in the United States and 36 representatives of unions in 13 Latin American countries present.

The International Alliance of Theatrical Stage Employees were represented by its President Richard F. Walsh, the American Guild of Musical Artists by Executive Secretary Hy Faine, the American Federation of Television and Radio Artists by Executive Secretary Donald F. Conaway, the American Guild of Variety Artists by Harold F. Berg, the Screen Actors' Guild by AAAA President Conrad Nagel, the American Federation of Musicians by Secretary Stanley Ballard, the Actors' Equity Association by Counsellor Sanford I. Wolff and the I.B.E.W. by Radio, TV and Recording Director Albert O. Hardy.

In accord with the objects and principles of this organization, great efforts were again made in plenary and committee sessions to find solutions to the continuing problems of workers in the Western Hemisphere. The sessions also were sources of information to the delegates; for instance, the Venezuelan musicians were concerned about the current introduction of video tape to their country and the Argentine delegation sought information about agreements for actors and artists performing for the same medium.

The I.F.E.W. works closely with O.R.I.T. (The Inter-American Regional Organization of Workers), the Western Hemisphere arm of the International Confederation of Free Trade Unions, and with the AFL-CIO, and the U. S. Department of State. This Congress welcomed the attendance of the Assistant Director of O.R.I.T., Mr. Morris Paladino, the Labor Attache of the U. S. Embassy in Caracas, Mr. Juan de Zengotita and the representative of the U.S.I.A. in Venezuela, Mr. Richard Martin.

The last previous Congress of the I.F.E.W., held at Lima, Peru, provided for the executive office of the organization to be established at Mexico City. That

A. O. Hardy of the I.B.E.W. and Sr. Emilio Villalobos of the Union of Radio and TV Workers, of Costa Rica, during a plenary session of the Congress.

I.F.E.W. Vice President Donald F. Conaway, A. O. Hardy of I.B.E.W. and Harold Berg of A.G.V.A. at a dinner session at the Hotel El Conde.

Congress also authorized the retention of a General Secretary for that office (a Trade Secretariat) and, concurrently, selected Juan Jose Osorio for the post. Brother Osorio's report to the 1964 Congress was adopted, with a rising vote of thanks by the delegates, and he was re-elected to the position of General Secretary for the ensuing term of two years.

While it can probably be said that no great and startling progress can be reported by the Inter-American Federation as yet, it has certainly accomplished a considerable interchange of information, given hope and encouragement to workers and unions South of the border of the United States and established an appreciation by all of the participating unions in North, Central and South America of the need of liaison and cooperation in keeping free trade unions free and democratic.

The I.F.E.W. is headed by its President Richard F. Walsh of the I.A.T.S.E., the Treasurer is Stanley Ballard of the A.F. of M., and Executive Committee members from the U. S. are Hy Faine of A.G.M.A. and Don Conaway of A.F.T.R.A. Two Vice Presidents are from South America—Hector Mario Spina of the Argentine Variety Artists and Carlos Lander of the Radio and Television Workers of Venezuela. Central America is represented by Amado Lopez Chinchilla of the Costa Rican Musicans, and the Republic of Mexico by Rafael Camacho Guzman of the Radio and Television Workers of Mexico. The Caribbean area is represented by Charles H. Fisher of the Bahamas Musicians Union.

World's Fair Will Be Covered Extensively by Radio and TV

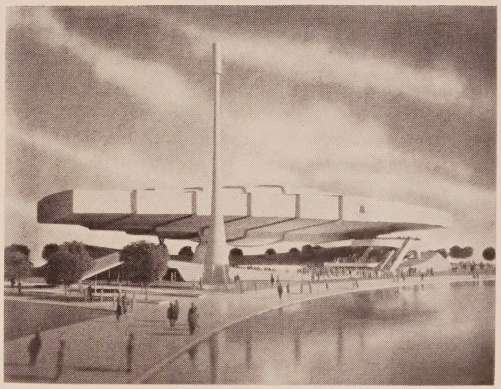
INNUMERABLE aspects of the New York World's Fair will be treated by TV and radio and will be carried to the farthest reaches of the earth, live and recorded.

To begin with, literature, tapes, discs and schedules of promotion went to about 6,000 stations here and abroad. Nations sending crews to do documentaries at the fair include Japan, Italy, France, Mexico and other Latin American countries, as well as from countries not represented at the fair such as Russia, Great Britain, Australia, Canada and Norway.

NBC-TV programs a half-hour of the *Today* show each week from the fairgrounds, devoting each program to a different pavilion. ABC-TV plans to telecast portions of the finals of the Olympic trials in wrestling, judo, fencing, weightlifting and boxing. CBS-TV plans to originate the Ed Sullivan show from the fair. The National Educational Television network is preparing four programs on various aspects of the fair. Radio originations are expected to include NBC's weekend *Monitor* show, Arthur Godfrey's CBS show and the Mormon Church, which will originate some programs for broadcast by WRUL Radio Worldwide, its shortwave station.

Ham radio operators will be encouraged to use station K2UF in the Coca-Cola pavilion to talk to their counterparts around the world. The Voice of America will broadcast the activities and special functions at many foreign pavilions.

Commercials on domestic programs can be expected to have many World's Fair backgrounds in the coming months to take advantage of the public awareness of the fair. Many of TV's largest advertisers will take advantage of tie-ins between sponsored TV programs and their own exhibits at the fair.



The Bell System Pavilion at the World's Fair, as shown in an artist's conception.

RCA's elaborate color TV presentation within its pavilion is expected to boost interest in color TV receiving set purchases. Within the next 18 months, about 100 million people will be exposed to the color TV presentations, which is expected to add considerably to the estimated one million color TV sets now in operation. The color TV activity will be continuous and RCA plans to have black and white monitors alongside the color monitors so the difference will be dramatically evident.

An unusual fillip is given news coverage at the CBS new headquarters building in New York, certain to be visited by a large number of those attending the fair. Local news and weather reports are received on direct telephone wires from CBS-owned stations all over the nation. The visitor simply picks up a telephone and receives his home-town news and weather report.

NEW HIGH QUALITY TAPE RECORDER AVAILABLE

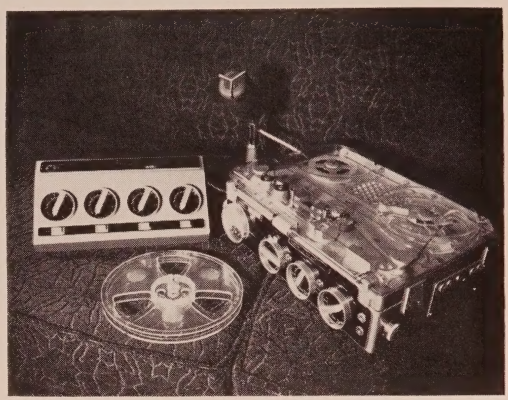
Swiss Recorder Appears on American Market

ONE of the most compact and probably the highest fidelity portable tape recorders to enter the American market is the Kudelski recorder made in Switzerland. Complete in its carrying case with a shoulder strap, the Kudelski weighs approximately 21 pounds complete with an auxiliary power supply and its self-contained batteries. Called the Nagra III, it very closely approximates a very high quality studio-type tape recorder and together with its similarly compact mixer affords four microphone inputs, with both portability and fidelity heretofore unattainable in the field.

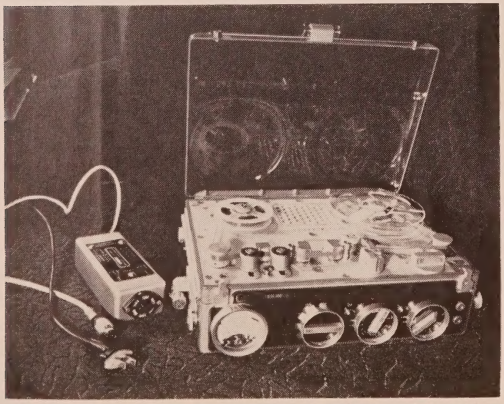
Both the mixer and the recorder are wholly transistorized. Eight transistors in the mixer are powered either from the self-contained batteries in the tape recorder itself or from an AC auxiliary power supply. The recorder contains twelve one and one-half volt Type D flashlight batteries and when alkaline cells are used the manufacturer claims a life of about 70 hours. Regular zinc-carbon cells will last somewhere between 10 and 20 hours in this service. The auxiliary power supply utilizes solid state rectifiers and, by means of a tap switch on the primary, can accommodate anything from 100 to 250 volts AC input.

The recorder is made to operate at 15 inches, 7½ inches or 3¾ inches per second. With the hinged plastic cover in place not more than a 5-inch reel can be accommodated, but with the cover open 7-inch reels may be used. Where the high quality of 15 inch per second tape is not required, a full hour of recording time can be recorded on a 5-inch reel and, by using the extra thin mylar tape, as much as 2 hours on a 7-inch reel at 3.75 inches per second.

There is a combination volume indicator and battery voltage meter on the front panel. Provision is made for a 600 ohm line output, headphone output and a self-contained speaker. There is also a position on the function switch which provides for automatic volume control for recording. The manufacturer warns, however, that the quality of recording is not at its best in the AVC position; principally, there is a low frequency roll-off. The usual use of the machine is anticipated to be in its "Hi-Fi" record mode. For single microphone input purposes, the mixer is unnecessary as the Cannon connector on the side of the recorder will accommodate a microphone input of either 50 or 200 ohms. For this use, a single microphone attenuator is provided on the recorder. If a line input is used, there is a separate volume control available, which is also used for the playback level—either feeding the self-contained speaker or the line output terminals.



The Nagra III and its mixer compared in size with a standard seven-inch tape reel and salt-shaker mike.



The recorder with the transparent lid raised and its 2½ x 2¼ x 6½-inch AC power supply.

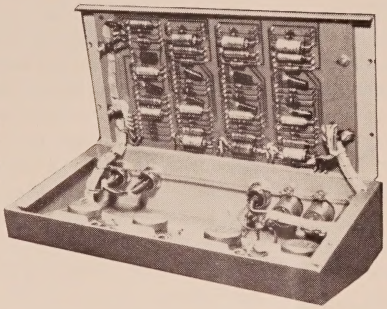
A very ingenious speed stabilization system is built into this machine, utilizing a servo-circuit. A knurled wheel on the motor shaft, which is also the shaft driving the capstan, passes in front of a magnetic head. The magnetic head thus has an alternating current induced in it, the frequency of which depends upon the speed of rotation of the motor shaft. This AC signal is amplified and shaped to a square wave of constant amplitude, which is fed to a frequency discriminator and then to the servo-amplifier controlling the motor speed. The DC output of the servo-amplifier varies, increasing or decreasing the motor current. Thus, when battery voltage varies the motor speed remains constant. If the battery voltage deteriorates to too

low a value, an alarm signal can be heard in the monitoring headphones and the recordist is thus made aware of the trouble.

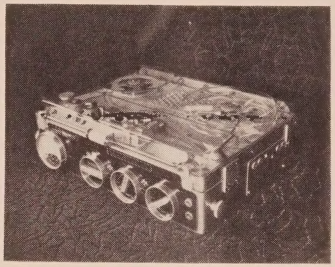
Another interesting feature of this recorder is the built-in oscillator (approximately 1000 cycles) which can be used to check the recorder input as well as to feed a tone on a line for level alignment.

There are 36 transistors in the recorder itself, including 9 transistors in the frequency discriminator and servo-amplifier circuits which govern motor speeds.

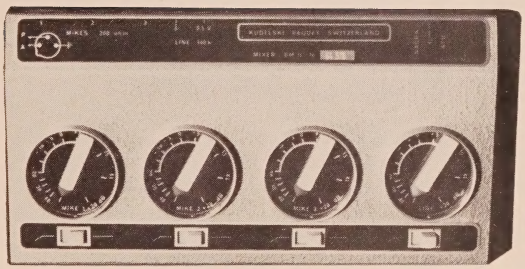
As can be seen by the accompanying photographs, this is a very high quality machine. It has a correspondingly high sale price. But for the broadcasters who demand high quality and a high degree of reliability, there is no really competitive product available on the market today.



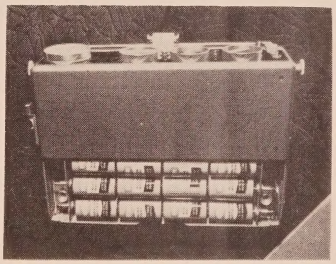
The electronics of the auxiliary mixer. The four identical circuits are easily discernible.



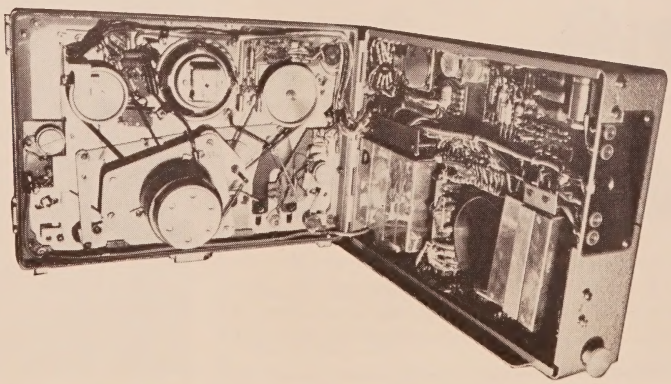
A view of the recorder from the right-hand side with the transparent plastic cover in place.



A top view of the four-position mixer.



The battery compartment, accessible from the bottom. Note the three tiers of the 12 flashlight cells.



The drive mechanism on the left and the transistor circuitry on the right. The left portion of this picture is the underside of the tape deck.

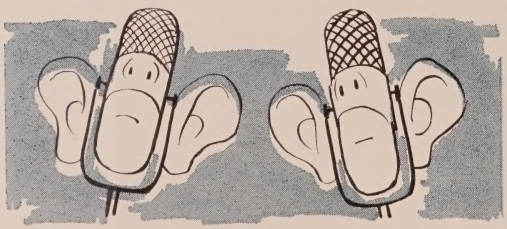
YOU'RE going to have to listen carefully to this. It has to do with ears and hearing and locating sounds and porpoises and men on airless planets along with an Alfred Hitchcock thriller-diller.

First off, you've got to consider how you know where a sound comes from. Many people go through life hearing sounds coming from places and not one time do they consider why or how. Homo sapiens have a couple of stereo receivers, one on each side of his head, and inside the osseous cabinetry he has a very involved mixer and preamp. This priceless package is perfected, however, so you can get stereo effects even though one of your receivers is out of whack.

You're supposed to locate sounds to the right of you because the sound hits your right ear first and the left ear a nanosecond *(so look it up)* or so later. But Dr. Dwight W. Batteau of United Research, Inc., Cambridge, Mass., has demonstrated that a person can locate a sound with only one ear.

Okay. Suppose we put two mikes out ahead of a person, positioned like ears are. We hook up the right mike to the right ear and the left mike to the left ear. Then we make a noise to one side or the other of the mikes. Will the person be able to distinguish the location? He should, it would seem, but he can't.

But Dr. Batteau takes two rubber replicas of the human ear and sticks them appropriately on the mikes. You know what? Now you could locate the sound!

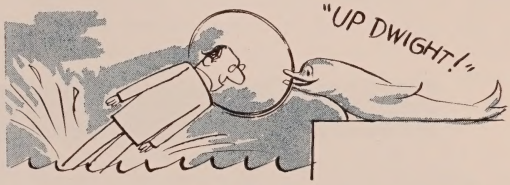


The research scientist has also demonstrated that distorting the shape of the human ear changes the apparent location of sounds. Evidently the convolutions of the human ear constitute a kind of sound labyrinth with an infinite baffle.

Why all this noise about ears, anyhow? It is a very practical matter with the U. S. Navy, which is always looking for sound advice in how to locate noisy objects such as enemy subs, ships, depth charges and the like. The Navy has about decided to start a recruitment program designed to enlist men with big ears.

United Research made some experimental ears, four times the normal size, and fitted them on navy men with normal ears. Wearing their Mae Wests (life jackets) and Clark Gables (super-snooper ears) the small-boat operators piloted their small boats directly to the sources of underwater noisemaking devices! Ear-ie, isn't it?

Pursuing his porpoise . . . purpose, sorry . . . Dr. Batteau has been talking to fish. Rigging up an electronic translator, he has been chatting with porpoises. The device converts human speech into porpoise whistles. Porpoises whistle as they swim around and ichthyologsists *(so look it up)* think they navigate by locating the position of objects which bounce their whistles back in echoes to them. Dr. Batteau says he has taught porpoises to mimic a series of words and phrases (like "Golly, what bony mullet"?) The Navy wants to discover the secret of the porpoise's ability to locate sounds underwater.



Then there's the airless void of space, where sound won't carry at all. If you were two feet away from another explorer on an airless planet, you couldn't hear him shout. You'd have to have electronic communications. But at the present time the source of radio communication can't be located except by triangulation. If Dr. Batteau's experiments continue proving up, perhaps the addition of duplicates of human ears to radio equipment may enable a spaceman to turn and face the source of his radio reception. Un-earthly, isn't it?

Returning to this common cosmos, such an application might come close to the "feelies" promulgated by H. G. Wells in his book, "Brave New World". The citizens of his future time, when they went to what we "savages" now call "movies," were able to see in full color and three dimensions, smell the surroundings seen, and, by grasping metal balls beside their seats, experience all the emotions and external stimuli being undergone by the actors on the screen. (If one of them is being horse-whipped, you let go the ball quickly; if it's a love scene, you might hold on a little tighter.)

All this is being noised around as being connected to national defense, space exploration, and the like. So if you hear of anything helpful, give Dr. Batteau a shout.

PRESIDENT DECLARES WAR ON *Poverty*; CALL FOR ENLISTMENT TO ALL AMERICANS

Let there be no mistake about the President's very strong feelings concerning the war against poverty. As Commander-in-Chief of the forces he is amassing, he makes it clear that the goal is complete and absolute victory over the "enemy."

While political action and political decisions are intimately involved in the war against poverty, no one can question that the prime motivation of the President is not political. Political action is only one of the weapons that must be used in the fight against human misery, despair, ignorance and starvation. It is a very personal thing with the President and his commitment and dedication cannot be questioned. Of this there can be no doubt in the minds and hearts of those who have heard him speak on the subject.

President Johnson has called enlistment in the war against poverty a religious imperative. "It is a Christian duty," to enlist in the anti-poverty fight, he has said. "It is a social duty," he continued, and then made it abundantly clear that it is also an American political—but not partisan—necessity to wage this war.

He has made it plain that there was no segment of society exempt from his call to battle. But, he has made it equally plain that he looks for the greatest support from the ranks of labor and labor leadership and from the ranks of our churches and synagogues and from the spiritual leaders of our nation.

This is *your* war, too. All Americans are soldiers in this war and have personal stakes in its outcome.

AT WHITE HOUSE RECEPTION

Albert O. Hardy, editor of THE TECHNICIAN-ENGINEER, was among labor press editors who were recently given a briefing on the aims and ambitions of the administration at the White House. The President greeted every editor individually after asking for their help and cooperation.

He made this point clear in Washington, D. C., April 27, at the Second Annual Labor Press Briefing on national and international problems, sponsored by the Labor Department and Secretary of Labor Willard Wirtz.

More than 150 labor editors from all over the nation assembled in an auditorium at the State Department to hear analyses of U. S. and world events from Secretary of State Dean Rusk, Attorney General Robert Kennedy, Secretary of Labor Wirtz, Assistant Secretary of Defense John McNaughton, Assistant Secretary of Labor Esther Peterson, and others.

The highlight of the day was a press conference with President Johnson in the East Room of the White House. This followed a reception at the White House, when each editor had an opportunity to shake hands with the President and First Lady.

THE WHITE HOUSE
WASHINGTON

May 7, 1964

Dear Mr. Hardy:

I was glad to meet you last week at the White House.

As I said then I want you to enlist in the war against poverty. With your help and the help of your readers, we can win this war.

For we have the means. We have the greatest industrial production of any nation, with the highest corporate profits and workers who have the highest income of any in the world.

More than 30 million Americans have not shared in this abundance. The gates of opportunity have closed on them. We must try to open those gates. There is no just reason why all our citizens not just most of them cannot share in the abundance of this nation.

I hope you will help us pass the Economic Opportunities Act of 1964, which is the constitution for the war on poverty. This legislation is essential, and you can help us pass it. It is a campaign we must win if we are to win the war. I ask for your support in this effort.

Sincerely,

Mr. Albert O. Hardy
International Brotherhood of
Electrical Workers
1200 15th Street, NW.
Washington, D.C.

ANOTHER HISTORICAL 'FIRST'

Automated Nuclear Floating Weather Station Will Report on Developing Gulf Hurricanes

THE world's first nuclear-powered, unattended, anchored, deep-sea automatic weather broadcasting station has recently gone on the air and is sending its weather observations for two and a half minutes every three hours. It has enough fuel to carry on this routine for the next 500 years.

The device, called NOMAD, is anchored in 11,200 feet of water at 25 degrees north latitude and 90 degrees west longitude, about in the center of the Gulf of Mexico. It is at about the intersection of two imaginary lines drawn from Brownsville, Texas, to Miami, Florida, and from New Orleans southward to the tip of the Yucatan peninsula. Here it will be able to advise weathermen of unusual weather conditions which might result in tropical storms, often spawned in this area.

It is held in position by a large mushroom anchor with a 1,200-pound ballast ball after 90 feet of heavy chain. The major distance to the surface is traversed by a one-inch woven polypropelene line which discontinues 1,000 feet below the surface. From this point to the top a three-quarter-inch stainless steel line takes over since fish, which generally cruise no deeper than that point, are inclined to nibble at strange objects. Below 1,000 feet, say authorities, "it's a calculated risk" but in the normal course of fishy events, they do not go anywhere near that deep. The entire anchor line measures 16,000 feet.

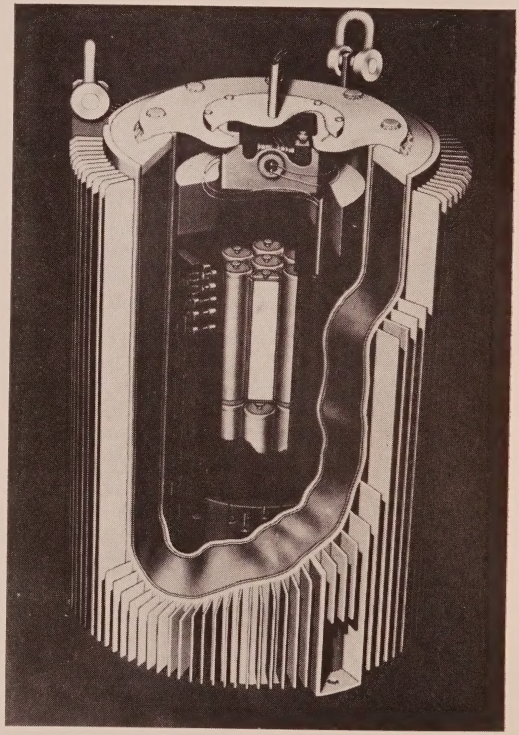
The device takes readings of wind speed and direction, the temperatures of the water and the air, and the atmospheric pressure. It averages these items for one and a half minutes, then transmits them in Morse code. With this information, meteorologists can deduce many other items, such as the presence of fog, rain, high seas, etc.

The transmitter averages 200 watts but is peaked to 4,000 watts and operates on 5340 kilocycles. At the present time it is received by a human operator in the FCC station in Fort Lauderdale, Florida. Eventually, it is planned, reception will be by a device which will automatically print the data and a command control will be added so readings can be obtained at any time rather than at three-hour intervals. The transmitter has an effective range of approximately 2,000 miles at night and about 1,000 miles in daylight hours. It is heard regularly at 8 a.m. by the FCC station in the nation's capital. It was developed by the Bureau of Naval Weapons, Division of Meteorological Management.

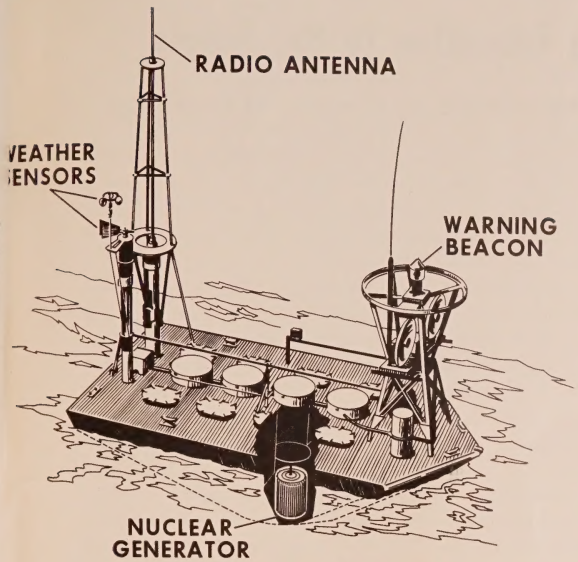
The power for the transmitter is furnished by the nuclear-powered device called SNAP-7D, derived from Systems for Nuclear Auxiliary Power, developed by the Martin Company, Baltimore, Maryland, for the Atomic Energy Commission and undertaken as a joint effort with the Navy Department.

While the device holds enough fuel for 500 years, it is expected that the device will need some sort of attention in about ten years. The entire apparatus, power generator, radio transmitter, and meteorological equipment, is contained on a 10- by 20-foot barge-like boat.

The nuclear generator is 34½ inches high, 22 inches



Cutaway of the SNAP-7D shows seven of the 14 fuel capsules at its center which contain strontium titanate pellets, providing the power source. Around the capsules are 120 pairs of lead telluride thermoelectric elements which convert heat from the decaying radioisotope into electricity. A three-inch shield of depleted uranium prevents radiation from escaping. Double layers of a virtually rupture-proof non-corrosive alloy, called Hastelloy C, encase the fuel. The fins on the outside are for cooling. Electricity produced by the generator is tapped from the wires leading out of the top.



Above: Schematic drawing of the NOMAD floating weather reporting station, anchored in more than two miles of water near center of the Gulf of Mexico. The barge is so designed that large waves will sweep over it without damage. Cutaway shows nuclear power generator in the hull. It broadcasts water and air conditions every three hours on a transmitter that peaks to 4,000 watts.

in diameter and weighs 4600 pounds, including shielding. It is fueled with about 20 pounds of strontium titanate. A special corrosion-resistant metal encases the 14 fuel capsules.

Inside the generator, heat from the decaying radioactive material is converted into electricity through 120 pairs of thermocouples, two dissimilar metals joined at both ends, producing a loop through which electric current flows because of the difference in temperatures.

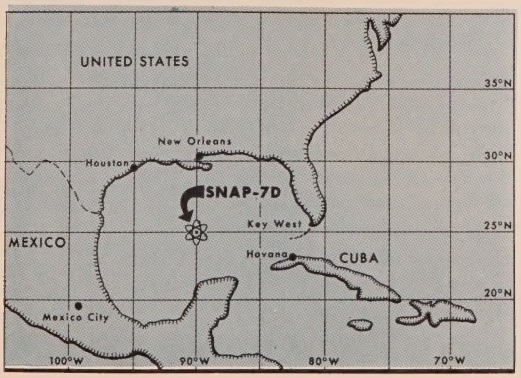
The generator produces electricity continuously and the power is stored in batteries, then used during the two-minute and twenty-second broadcast eight times in a 24-hour day. The nuclear-generated power is also used to light a navigation beacon to warn passing ships.

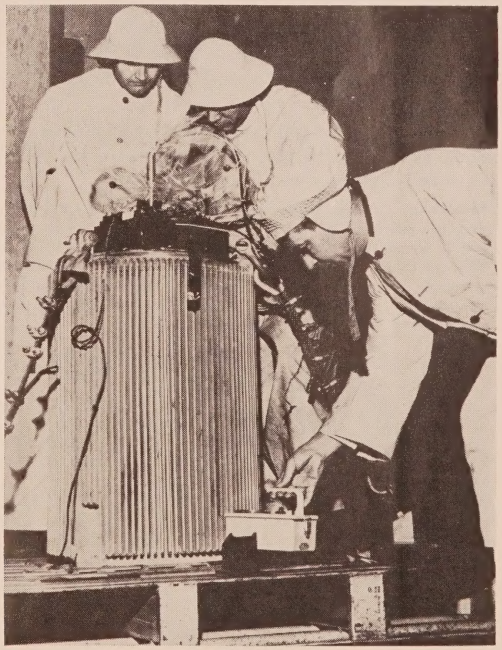
Since no moving parts are involved, nothing in the generator is subject to mechanical failure. The heavy depleted uranium shielding reduces external radiation to acceptable levels and contributes to the over-all ruggedness of the unit.

The fuel compound used, strontium titanate, is insoluble and biologically inert, with a melting point so high that it could not be dispersed by even the hottest gasoline fires. Its rate of solubility in fresh water is so low that it has never been measured and even in salt water its solubility is measured in parts-per-billion.

The NOMAD weather station (Navy Oceanographic Meteorological Automatic Device) is the forerunner of a world-wide network of unattended weather stations. The network will produce data for world-wide weather forecasting.

The first nuclear-powered generator, a five-watt unit, recently completed a successful two-year test on Axel Heiberg Island, several hundred miles from the North Pole near the Arctic Circle, where it has been powering an unmanned weather station, a joint project of the U.S. and Canadian weather bureaus.





Above: Engineers ready the 60-watt nuclear generator for installation in the Navy weather boat. The atomic NOMAD, forerunner of a world-wide reporting network, is now sending regular weather reports of the Gulf of Mexico. The generator, SNAP-7D, developed by Martin Company's Nuclear Division, Baltimore, for the Atomic Energy Commission, is the largest of a series of nuclear generators under development for the AEC. The generator, 34½ inches high and 22 inches in diameter, turns heat from strontium-90 directly into electricity. Strontium-90 is a waste product of nuclear reactors.

At left: Map shows the location of the NOMAD.

Gas-Powered TV May Bring Education to the Jungle

Community Television Sets in Villages Envisioned as Centers of Learning

ONE of the greatest needs of underdeveloped and "emerging" nations is education and one of the most effective teaching mediums is television, most authorities agree.

But how to get television into jungle areas where power lines, even roads, are non-existent?

TEPS may be the answer, thinks a Washington, D.C., electronics firm.

TEPS is "thermoelectric power supply" and, if you have a hot water heater or a central heating plant, the chances are TEPS, in a small but vital way, has been serving your interests for years. In the system, quantities of electric power are generated by the movement of electrons through a closed circuit involving two dissimilar metals. The method is an old one, having been first evolved in 1822. In a central heating plant or a hot water heater, the dissimilar metals electrical generator system is used to provide small amounts of electric current to keep fuel valves open. If the pilot light, which provides the heat to the TEPS unit, fails the current stops and the valve is cut off, thus avoiding explosions and fires.

A unit which will provide 50 watts of power is now being produced with propane as the fuel. The cost of generation is about 66 cents per kilowatt hour, which is two or three times less than the cost of operating a gasoline-powered generator. The firm says it has lighted a house trailer and operated a TV set in it for a total fuel cost of 24 cents a day.

Technician adjusts antenna of standard small television receiver powered by bottled gas. Propane held in flash at left is connected to thermoelectric generating unit by hose through pressure gauge. Thermocouples inside the housing generate electricity fed to TV set by two wires (note terminals). Tall stack carries away spent exhaust gas. Image can be seen on screen of the receiving set.

The proposal of the Washington, D.C., firm, Gallant, Inc., is to place a thermo-electric-powered television set in each of the villages in remote sections of underdeveloped nations. Programs would be fed to the villages by a microwave relay system. The latter would be set up in three stages. First helicopters would bring in engineers to pick out the highest land areas as sites for relay towers. A second helicopter would bring in a prefabricated foundation for a relay tower and the third would bring in the tower itself. By thus doing away with the necessity of building access roads into remote areas, the price of such relay systems could be reduced immensely, Gallant, Inc., officers declare.

At a central station, video tapes would be used to demonstrate to villages along the video relay route such items as proper health practices, improved agricultural practices, and various educational programs designed to assist the nation to develop.

The recent advances in transistors and microcircuitry which have made 15-watt television receivers possible have made such a program feasible. In addition to the TV channel, such microwave relay systems could also carry telephone conversations between the villages, thus dooming the time-honored jungle drums to a limbo of the late, late, late show.

Communications Era Comes to End; B&O Railroad Abandons Telegraph

A milestone in the history of man's efforts to improve his methods of communications was passed recently when the Baltimore and Ohio Railroad discontinued the use of the magnetic telegraph on its Baltimore Division.

It was on May 24, 1844, that the first magnetic telegraph message was sent in the U.S. The inventor, Samuel F. B. Morse, tapped out "What hath God wrought?" over a 40-mile stretch of wire between Washington and Baltimore. This line eventually became the link of the Baltimore and Ohio Railroad between Washington and the Maryland city.

Initially it was supposed to be supported by the government but the then Postmaster General decided it was "nothing but a toy that would never support itself" and government support was withdrawn.

Communications on the B&O are now being handled by automatic printers and voice lines.

THE LABOR MANAGEMENT WHIRL

• *Like U.S. electronics producers, the American Indians have experienced difficulties with Japanese competition. In Macy, Nebraska, a frowning Omaha Indian chief explained: "It was either automation or the Japanese." He was referring to a decision by the tribe to install a fully automated assembly-line to mass-produce Indian tepees. This summer the traditional Redskin tents, five and six feet in diameter, will be manufactured for the tourist trade almost without the involvement of human hands; and canvas will replace animal skins.*

"We had to do something," the chief explained. "It's not only the Japanese-made tepees. Our Indian reservations in the midwest are starting to sell moccasins, feathered headdresses, tomahawks and—so help me!—even fake scalps, all made in Hong Kong!"

• *The Cleveland, Ohio, AFL-CIO has donated $5,000 to a fund to launch an educational television station there. "Organized labor in Cleveland is pleased to support the forward-looking concept of educational television," stated Federation President Patrick J. O'Malley.*

• *A scenario beyond the wildest dreams of Hollywood script writers was acted out in a Philadelphia courtroom with big business providing a crazy, mixed-up backdrop. General Electric and five other multi-billion-dollar firms were being sued for $12,000,000 on grounds that they had swindled the public through a huge price-fixing conspiracy.*

The star witness against GE turned out to be William S. Ginn, former GE vice president and the number one conspirator in the price-fixing plot. On and on Ginn testified and his statements rocked GE back on its heels. Then at the conclusion of his devastating testimony Ginn sent even the judge's eyebrows jumping toward his scalp when he blithely disclosed that he still drags down $18,000 a year from GE—in dividends.

• *Cancellation of the Baltimore, Md., Guy Nunn radio show "Eye Opener" by station WCBM has brought a strong complaint to the Federal Communications Commission by the United Automobile Workers.*

The UAW has asked the FCC to revoke the station's broadcast license which was granted Metromedia, Inc., its operator, only last year. "Eye Opener" has been carried by WCBM since 1955.

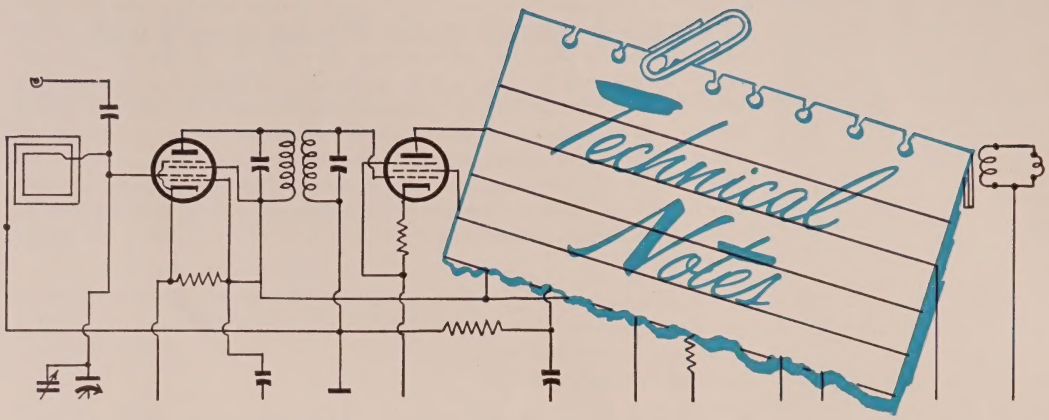
In its petition, the UAW charged that Metromedia's cancellation of the program was a "flagrant act of political censorship." It cited sworn statements by Secretary-Treasurer William B. Scheffel of the Maryland State and District of Columbia AFL-CIO and by President Dominic Fornaro of the Baltimore Council of the AFL-CIO declaring that "Eye Opener" had been canceled at the request of a DuPont representative in New Jersey.

Cancellation of the program, the UAW said, will result in hurting the union during its coming negotiations with the automobile industry. The UAW protested that while its time had been taken away from it, the same time had been assigned to two automobile manufacturing companies.

In addition, monitoring of WCBM showed that the automobile industry had purchased advertising for nearly 50 percent of all news and commentary programs aired by the station.

• *Union radio announcers and union telephone workers agreed reluctantly that you can fool some of the people an awful lot of the time. Their conclusion came after Announcer Jim Feather, of Station WCLG, of Morgantown, West Va., urgently advised his listeners to "cover your telephones with heavy towels or bedsheets." The telephone company, he explained, was starting its spring cleaning and would be blowing out its lines, which would cause clouds of dust and soot to spray out of the home receivers. Unless the phones were covered, Feather warned, his listeners might get black faces.*

Two hours later phone company Manager Joseph Hanna complained to Feather that the company had received "literally hundreds" of outraged protests. Only then did Feather tell his listeners: "April Fool!"



LAST SPURT FOR VHF SETS

Television retail dealers, aware that millions of prospective purchasers live in areas where there is no UHF programming and no foreseeable installation of same, were held to be responsible for the big spurt in VHF receiver production prior to the cut-off date whereinafter no set without UHF could be manufactured.

According to industry estimates, set production in January and February was 20 percent larger than in the same period of 1963. Ordinarily there are about 1.5 million sets moving in distribution channels at any given time. During the pre-cutoff period, industry spokesmen declared there were probably as many as 2.5 million in motion between factories and purchasers.

The last opportunity to sell VHF-only sets made it possible to market sets about $20 cheaper than with UHF incorporated into them.

ELECTRONIC HAND REPORTED

An Associated Press dispatch from Moscow reports that a British delegation to Russia was so impressed by a Soviet-developed electronic hand for crippled people that it began negotiating at once for rights to take it to Great Britain.

Ultimately, they hoped, the hand could be developed far enough to be used by thousands of babies born malformed because of the intake of thalidomide by their mothers.

The hand works by means of a cathode contact pressed to the skin near a muscle in the surviving part of the arm. A light movement of that muscle generates a tiny current of electricity which is transmitted through transistors to a motor that controls a flexible hand.

Development of the arm reportedly grew out of research connected with the Soviet space program. Its advantage lies in the fact that its mechanism can be manufactured by any first class radio electronics plant.

FAIR RELAYED II EUROPE

Part of the opening day ceremonies at the New York World's Fair was carried to 15 European countries via Relay II satellite. Seven countries used their own announcers, broadcasting in their native languages on direct audio lines.

MINIATURIZATION BIG

Automation and miniaturization were the two outstanding aspects of the equipment displayed at the recent convention of the National Association of Broadcasters in Chicago.

There is a running tide toward solid-state circuits in all sections of the industry. Applications of transistors to virtually all circuitry have been varied and ingenious. The trend seemed to be toward more color TV, more small video tape recorders, more UHF and FM, particularly stereo. More components come in modular, plug-in form for easy maintenance and quick replacement. With transistorization increasing, there are modules-within-modules. There are many tape cartridge systems, many in slick new cabinetry and decorator colors. Remote control transmitter systems, TV program switching and control functions, automatic logging and station traffic-billing paperwork all trended toward automation.

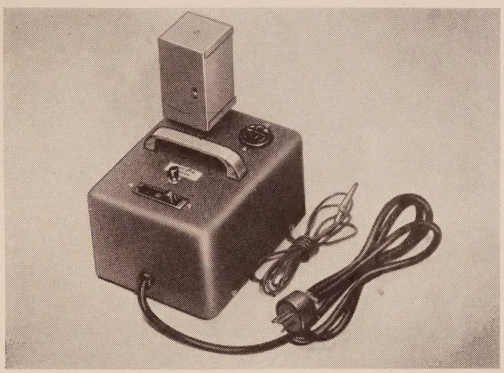
Observers noted the absence of few really new products, with the emphasis being placed on greater miniaturization, automation and streamlined packaging of previously-existing equipment.

SCOUTING GOES ELECTRONIC

Ex-Boy Scouts who earned their merit badges by burning baked potatoes and lighting fires with one match will be interested to know that now, belatedly, a merit badge for electronics has been added to the Boy Scout list of achievement awards. Robert W. Sarnoff, vice president of the Greater New York Council of the BSA, presented the first 32 such badges recently.

TO ELIMINATE SHOCK HAZARDS

A device to eliminate electric shock hazards from alternating and pulsating direct-current circuits, called the Hazard Sensor, has been developed. It protects humans from electrical shock and, additionally, shuts down electrical equipment when hidden or unforeseen dangerous faults develop.



The Hazard Sensor to eliminate hazards.

Consisting of an isolation transformer of varied load acceptances and capacities, it promises significant applications in the problems of accident prevention in industry, laboratories, swimming pools and computer systems. It protects from hot electrical lines, opening the electrical source before any shock can be experienced.

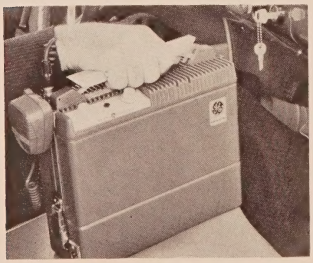
The developer, Shock-Proof Electronics, Inc., 1601 Girard Trust Bldg., Philadelphia, invites inquiries for either standard or special applications.

NEW LIGHTWEIGHT CAMERA

Mitchell Camera Co. has announced a new 24-pound, 16mm, sound-on-film reflex camera, run by rechargeable battery and capable of being operated when hand-held. Price: $6,515.

VERSATILE TWO-WAY RADIO

A new concept in two-way radio—a "Porta-Mobil" VHF-FM unit described as the first of its kind—is now available from General Electric Communications Products Department, Lynchburg, Va.



It triples as a plug-in mobile radio in a car, as an office base station, and as an expanded-range portable with the highest radio power output ever packed in a self-powered hand-carried design.

Of particular interest to broadcasters is its ability to stay on the air for long periods of time. It may be on the air more times per hour than previous units and longer per individual message when required—a help for remote events.

G-E engineers say the 13-pound unit's duty cycle far exceeds previous industry duty standards established for mobile equipment and portables. When operated from an internal battery supply, the transmitter may be keyed continuously as long as the batteries last without damaging the radio's components.

The new equipment has up to 18 watts of transmit power in low band frequencies (25-50 mc.) and up to 10 watts in high band (132-174 mc.).

Engineered with all solid state circuits—no tubes—it uses silicon transistors in all transmitter and receiver circuits and also employs other advanced semiconductor components to increase reliability and operating performance. The Porta-Mobil is 11 inches by 3⅝ by 9⅛ inches, or half the size of the highest power hand-carried unit previously available.

As a mobile radio in a car, it is plugged into the cigarette lighter and linked to a fixed antenna to give an additional boost to communciations coverage. As a temporary base station in an office, it plugs into a 117 volt AC electrical outlet.

A new voltage regulation circuit—an innovation in the receiver and transmitter—provides "stay-stable" operation over wide changes in battery voltage.

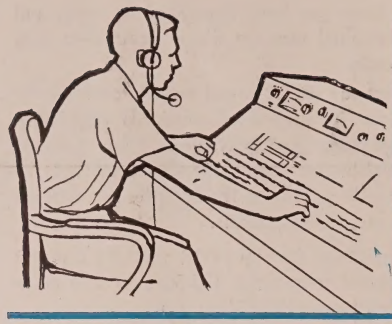
Tantalum and mylar capacitors are used extensively in critical circuits. Silicon transistors are employed throughout the transmitter, receivers, and associated options. This allows the unit to operate at low temperatures and at extremely high ambient temperatures up to 158° F.

A choice of snap-on battery supplies is available. Units are supplied with either nickel-cadmium rechargeable batteries or alkaline D-cells. No "B" batteries are necessary. To change from D-cells to rechargeable operation, the user unsnaps one pack and snaps on the other.

In nickel-cadmium versions, recharging is made easy by a charger built into the snap-on pack. This permits recharging any place where AC power is available. An external charger does not have to be carried along. An internal battery-saving audio switch may be adjusted to reduce speaker power from 1.5 watts to 100 milliwatts.

It is available with a two-frequency transmitter and two-frequency receiver. It can be obtained with Channel Guard for channel-shared systems. Individual selective calling plus "all call" options are also available. Option space is provided inside of the basic radio case.

Also among optional accessories are an under-dash mounting kit; a clip-on gutter-mount mobile antenna; DC charging cable for 12 volt negative ground operation; and a leather protective jacket. The unit itself is weatherproof.



STATION BREAKS

WTCN-TV, TWIN CITIES, SOLD

Members of Local 292, Minneapolis-St. Paul, employed at WTCN-TV have a new boss: Chris-Craft Industries Inc. The station was sold early this month by Time-Life Broadcast Inc. for approximately $4 million.

The transaction, when approved by the FCC, will give Chris-Craft Industries its third independent TV station. Others owned by Chris-Craft include KCOP-TV, Los Angeles, and KPTV-TV, Portland, Oregon.

1964 PROGRESS MEETING, AUGUST 18, 19, 20

WGN'S LINCOLN THEATRE

WGN, Chicago, has exclusive radio and television rights to daily programs honoring Abraham Lincoln from the Illinois Pavilion at the New York World's Fair. Special events in the theater may range from addresses by world-famous Lincoln scholars or distinguished members of the government to the reading of an eighth grade Lincoln essay by its youthful author.

1964 PROGRESS MEETING, AUGUST 18, 19, 20

TRAFFIC REPORT TEAM, DETROIT

Seven area broadcasters in Detroit have joined with Detroit police in a freeway radio-teletype network to benefit local motorists. Freeway patrol cars of the police traffic bureau report by special short-wave radio to traffic central, located at police communications headquarters. Officers experienced in freeway patrol coordinate the information and send a traffic advisory or a bulletin by Teletype to the participating stations.

THE 1964
PROGRESS MEETING

•

The Stardust Hotel
Las Vegas, Nevada

•

August 18, 19, 20

Be Sure to Send a Representative

KNEE-DEEP IN NEWSMEN

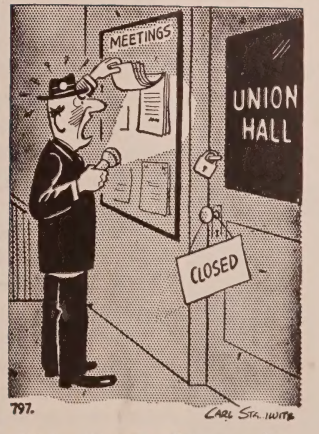
IN ATLANTIC CITY, for the first time in history when the Democratic National Convention opens on August 24 convention delegates will be outnumbered by newspapermen and radio and television reporters, most of them union members. Delegates and alternates will total 5200, but the news representatives already number 5500.

1964 PROGRESS MEETING, AUGUST 18, 19, 20

'RIGHT TO WORK' IS PHONY

The phrase "right-to-work" is "false . . . misleading . . . prejudicial" in the opinion of the Oregon Supreme Court, which has barred its use on an initiative petition for a referendum for a state constitutional amendment outlawing the union shop. The Court, after hearing arguments by the State AFL-CIO and the Teamsters, rewrote the title of the petition to read, "A constitutional amendment prohibiting union security contracts."

LAST LAUGH



"A fine thing! I rush to our union meeting, and find they changed our monthly date two years ago without telling me!"

ROLAND KISSLER
BOX 259
NO 839 LAKE WASH
LU-17
BN